Listing of Claims

Please amend claims as follows:

1. (Currently Amended) A modulator, comprising:

an adder configured to ~~combine~~ add a first nonnegative continuous-time signal and a nonnegative binary output signal to form a first nonnegative intermediate signal,

~~an~~ a leaky integrator operably coupled to the adder and configured to receive the first nonnegative intermediate signal and generate a second intermediate signal therefrom,

~~a~~ an inverting bistable device operably coupled to the integrator and configured to receive the second intermediate signal, and generate the nonnegative binary output signal therefrom, and

a feedback loop coupling the inverting bistable device and the adder to provide the nonnegative binary output signal to the adder.

2. (Original) The modulator of claim 1, wherein the modulator is an all-electronic device.

3. (Original) The modulator of claim 1, wherein the modulator is an all-optical device.

4. (Cancelled).

5. (Currently Amended) The modulator of claim [[4]] 1, wherein the leaky integrator has a transfer function of $\frac{g}{s+\frac{1}{\tau}}$ where g is the gain coefficient and τ is a finite period of time.

6. (Cancelled).

7. (Cancelled).

8. (Cancelled).

9. (Original) A system, comprising the modulator of claim 1, and a computing device coupled to the modulator and being configured to adaptively modify parameters of the modulator to optimize performance.

10. (Currently Amended) The system of claim [[8]] 9, wherein the computing device is configured to modify at least one of sampling frequency and input signal range.

11. (Currently Amended) The modulator of claim 1, further comprising at least one multi-level inverting bistable device.

12. (Original) The modulator of claim 1, wherein the feedback loop includes a delay.

13. (Currently Amended) A method for converting a continuous time signal to a binary signal, comprising the steps of:

receiving a nonnegative continuous time signal,

adding a nonnegative binary signal to the nonnegative continuous time signal to produce a first nonnegative intermediate signal,

processing the first nonnegative intermediate signal through a leaky integrator to produce a second ~~intermediately~~ intermediate signal, and

processing the second intermediate signal through ~~a~~ an inverting bistable device to produce the nonnegative binary signal.

14. (Currently Amended) The method of claim 13, further comprising the step of modulating a light signal with the nonnegative continuous time signal.

15. (Original) The method of claim 13, further comprising the step of adaptively adjusting at least one of input signal range and sampling interval.

16. (Currently Amended) A modulator comprising:

an amplifier configured to amplify a continuous-time signal,

an optical isolator configured to receive a light signal,

an electro-optic modulator coupled to the optical isolator and the continuous-time signal amplifier, the electro-optic modulator configured to receive the amplified continuous-time signal and modulate the light signal thereby,

a fiber-optic coupler configured to ~~receive~~ add the modulated light signal ~~modulated by the continuous-time signal~~ and a feedback signal,

a leaky integrator configured to generate an integrated signal from output of the first fiber-optic coupler,

~~a~~ an inverting bistable device configured to generate a binary signal from the integrated signal, and

~~a feedback loop configured to provide continuous operation of the modulator~~ a second optical coupler coupled to the inverting bistable device configured to provide a binary output signal and the feedback signal.

17. (Original) The modulator of claim 16, wherein the leaky integrator is configured to provide exponential decay of optical density.

18. (Original) The modulator of claim 17, wherein the bistable device is a multiple quantum well device.

19. (Original) The modulator of claim 16, wherein the amplifier, the optical isolator, the fiber-optic coupler, the leaky integrator, the bistable device, and the feedback loop are contained on a single chip.

20. (Original) The modulator of claim 16, further comprising a second leaky integrator coupled to the bistable device.